CHAPTER 3

METHODOLOGY

3.1 Introduction

CivilFEM is a powerful tool for high-end civil engineering analysis design. CivilFEM ANSYS and inherits all the features based on the ANSYS, provides special before and after the treatment, analysis, design, verification tool for civil engineering. From the previous studies, the finite element analysis provides an approximate solution, the result is not complete and can be used for the actual design reasonable confidence. This is because there are different ways of meshing for finite element program such as structural change analysis results can be obtained. Therefore, the comparison between the need to hand calculation and finite element analysis to determine their efficiency and reliability (Argyris and Kelsey, 2004).

In order to fulfill the objective of this study, the application of finite element method in the analysis of structure of the box girder by using ANSYS+CIVILFEM 12.0 version of the software. From the finite element method code will be converted into ANSYS Parametric Design Language (APDL) continue to need to be provided by the multiple values of parameters to generate a new equation of the target insertion range (Thieffry, 2008).

Methodology is a significant part to guide the procedures that need to be implement to achieve the objective of this research. There are several steps are taken to

conduct this research:

(i) Collecting the data for box girder.

(ii) Generating the 3-Dimension structure modeling of box girder.

(iii) Run the process of simulation and analyzing the model by using ANSYS+CIVILFEM 12.0 software.

(iv) Solve the equations.

(v) Run though the PDS analysis and get the probabilistic result.

(vi) Assign the log file.

(vii) Put the variable input.

(viii) Select the variable output.

(ix) Cancel the '0' values.

(x) Choose probabilistic method.

(xi) Choose Monte Carlo Sims.

(xii) Choose Direct Sampling.

(xiii) Put the numbers of the simulations.

(xiv) Choose Execute ALL Sims.

(xv) Choose Continue CONT.

(xvi) Choose Run Serial.

(xvii) Put the Solution Set Label.

(xviii) Choose Save sample File copy. 'Yes'.

(xix) Put the label for the Copy Sample File folder.

(xx) Click 'ok' to start Monte Carlo Simulations.

(xxi) Each time the Verify windows shows up click 'Yes'.

(xxii) Choose Report Options.

(xxiii) Choose Random variable Definitn is 'Tables & figs'.

(xxiv) Choose Statistics for Parameters is 'Input & Output'.

(xxv) Choose Sample History of Output is 'ALL types'.

(xxvi) Choose Histograms for Parameters and Cum. Distr. F Parameters are both 'Input & Output'.

(xxvii) Choose Sensitivity Plots for … is 'Spearman & Linear'.

(xxviii) Choose Correl. Matrix between… is 'ALL (II/IO/OO)'.

(xxix) Generate the probabilistic report.

The following chart below is used to delegate the entire process among this

research to fulfill the objective.

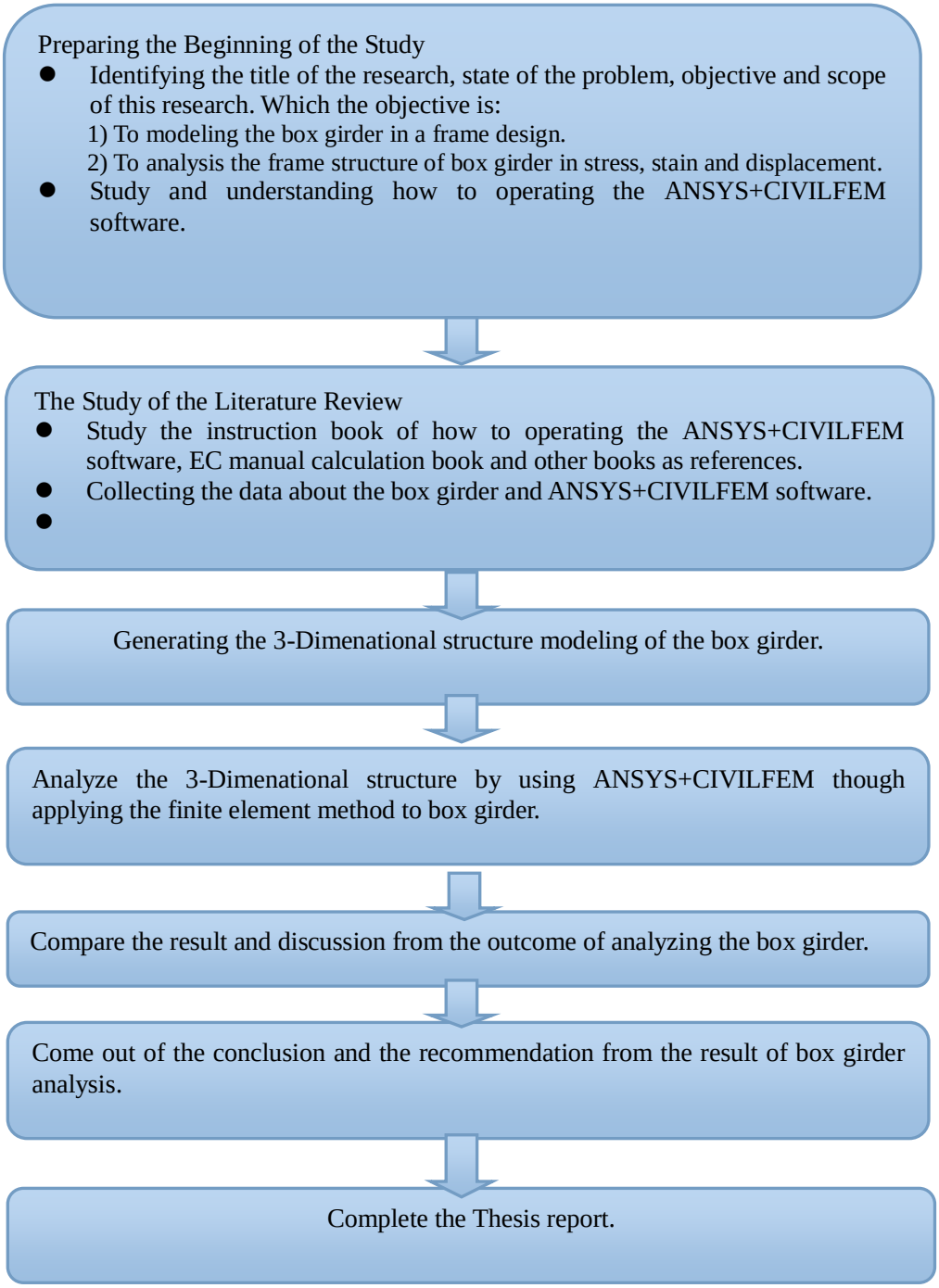

Figure 3.1: Flow Chart for the Entire Research Process.